

**EPA REGION 6
5TH ANNUAL MS4 OPERATOR'S CONFERENCE
CORPUS CHRISTI, TEXAS
11 JUNE 2003**

MS4 PROGRAM COST ESTIMATING AND FUNDING OPTIONS

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TOPICS

- **Anticipated Phase II Costs**
- **MS4 Program Cost Estimating**
 - Anticipated Costs
 - Estimating Tool
 - Expenditure Planning Considerations
 - Revisions
- **Funding Options**
- **References**

www.mde.state.md.us

ANTICIPATED COSTS

SUMMARY OF AVERAGE ANNUAL PER CAPITA COST ESTIMATES

Source	Basic Program	Program	Advanced Program
APWA ¹	\$1.28	--	\$5.63
NLC ²	\$1.35	--	\$7.34
EPA ³	--	\$3.34 (Calculated)	--
Average	\$1.32	\$3.34	\$6.49

COST ESTIMATE SOURCES

1. **American Public Works Association, 1998.** *Designing and Implementing an Effective Storm Water Management Program, Proposed Storm Water NPDES Phase II.*
2. **National League of Cities, 1999.** Storm Water Workshop, March 5, Washington, DC.
3. **Federal Register, 1999.** *National Pollutant Discharge Elimination System... Final Rule,* December 8, pp. 68,791. Per capita amount calculated using 2000 Census average household size for Texas.

ESTIMATING TOOL

- **Develop spreadsheet with global rates**
- **Consider various expense categories**
 - Labor
 - Equipment
 - Contracted services
 - Consumables
 - Media buys
- **Identify cost items for each BMP**
- **Calculate costs by year using estimated quantities**
- **Summarize by year and by measurable goal (program area)**
- **Calculate per capita and household costs for comparison**



CITY OF ANYTOWN STORM WATER MANAGEMENT PROGRAM COST ESTIMATE - PREPARED BY PBS&J

PREPARED MAY 15 2003

STORM WATER MANAGEMENT PROGRAM - COSTS	ANNUAL COSTS					5-YR Permit Cycle Cost	Y6 (Post Startup Ongoing Annual Cost)	Remarks
MCM	Y1	Y2	Y3	Y4	Y5			
MCM-1 - PUBLIC EDUCATION AND OUTREACH	\$ 16,480	\$ 15,100	\$ 14,250	\$ 17,560	\$ 15,770	\$ 79,160	\$ 15,485	
MCM-2 - PUBLIC PARTICIPATION AND INVOLVEMENT	\$ 23,748	\$ 17,948	\$ 17,648	\$ 17,248	\$ 16,948	\$ 93,538	\$ 16,948	
MCM-3 - ILLICIT DISCHARGE DETECTION AND ELIMINATION	\$ 19,407	\$ 54,007	\$ 33,947	\$ 35,283	\$ 33,843	\$ 176,487	\$ 31,438	
MCM-4 - CONSTRUCTION SITE RUNOFF CONTROL	\$ 10,220	\$ 21,689	\$ 15,860	\$ 20,540	\$ 19,820	\$ 88,130	\$ 20,180	
MCM-5 - POST CONSTRUCTION RUNOFF CONTROLS	\$ -	\$ 14,300	\$ 16,100	\$ 14,200	\$ 11,800	\$ 56,400	\$ 8,800	
MCM-6 - GOOD HOUSEKEEPING IN MUNICIPAL OPERATIONS	\$ 8,400	\$ 43,400	\$ 59,640	\$ 35,600	\$ 30,600	\$ 177,640	\$ 10,600	
ADMINISTRATIVE COSTS (Annual Reporting, Etc.)	\$ 8,400	\$ 8,880	\$ 8,880	\$ 8,880	\$ 8,880	\$ 43,920	\$ -	
PHASE II COMPLIANCE TOTAL	\$ 86,655	\$ 175,324	\$ 166,325	\$ 149,311	\$ 137,661	\$ 715,276	\$ 103,451	
POPULATION (2000 CENSUS)	60,000							
PER CAPITA COST (Annual)	\$ 1.44	\$ 2.92	\$ 2.77	\$ 2.49	\$ 2.29	\$ 2.38	\$ 1.72	
TOTAL HOUSEHOLDS (2000 CENSUS)	23,483							
HOUSEHOLD COST (Annual)	\$ 3.69	\$ 7.47	\$ 7.08	\$ 6.36	\$ 5.86	\$ 6.09	\$ 4.41	
HOUSEHOLD COST (Monthly)	\$ 0.31	\$ 0.62	\$ 0.59	\$ 0.53	\$ 0.49	\$ 0.51	\$ 0.37	
CITY STAFF HOURS	ANNUAL HOURS					5-YR Permit Cycle Hours	Y6 (Post Startup Ongoing Annual Hours)	Remarks
MCM	Y1	Y2	Y3	Y4	Y5			
MCM-1 - PUBLIC EDUCATION AND OUTREACH	223	195	175	186	177	956	176	
MCM-2 - PUBLIC PARTICIPATION AND INVOLVEMENT	261	181	181	181	181	985	181	
MCM-3 - ILLICIT DISCHARGE DETECTION AND ELIMINATION	280	300	344	530	506	1,960	468	
MCM-4 - CONSTRUCTION SITE RUNOFF CONTROL	72	132	256	334	322	1,116	328	
MCM-5 - POST CONSTRUCTION RUNOFF CONTROLS	0	0	20	40	180	240	130	
MCM-6 - GOOD HOUSEKEEPING IN MUNICIPAL OPERATIONS	50	50	154	170	170	594	170	
ADMINISTRATIVE COSTS (Annual Reporting, Etc.)	140	148	148	148	148	732	148	
PHASE II COMPLIANCE TOTAL	1,026	1,006	1,278	1,589	1,684	6,583	1,601	
FTE - FULL TIME EQUIVALENTS (see "Cost Items" for FTE hour estimate)	0.70	0.68	0.87	1.08	1.15	n/a	1.09	
VEHICLE TIME (hours)	191	218	271	411	491	n/a	471	
VTE - VEHICLE TIME EQUIVALENT (see "Cost Items" for VTE hour estimate)	0.10	0.12	0.15	0.23	0.27	n/a	0.26	

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MCM-3 - ILLICIT DISCHARGE DETECTION AND ELIMINATION						FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		Permit Cycle Cost	SIXTH YEAR		Remarks Assumptions
BMP	Activity	Due Date	Cost Item	Unit Cost	Units	Qnty.	Cost	Qnty.	Cost	Qnty.	Cost	Qnty.	Cost	Qnty.	Cost		Qnty.	Cost	
EXISTING																			
Littering Ordinance	Enforce existing ordinance prohibiting littering. Track enforcement actions.	Y1-5	City Staff	\$ 60	Hour	120	\$ 7,200	120	\$ 7,200	120	\$ 7,200	120	\$ 7,200	120	\$ 7,200	\$ 36,000	120	\$ 7,200	1P 3W per year
		Y1-5	Vehicle Time	\$ 6.26	Hour	80	\$ 500	80	\$ 500	80	\$ 500	80	\$ 500	80	\$ 500	\$ 2,502	80	\$ 500	Assume 2/3 time spent in field.
Nuisance Abatement Ordinance	Enforce existing ordinance prohibiting the creation of nuisance conditions, including dumping. Track enforcement actions.	Y1-5	City Staff	\$ 60	Hour	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	\$ 12,000	40	\$ 2,400	1P 40H to investigate enforce & track nuisances identified by City staff.
		Y1-5	Vehicle Time	\$ 6.26	Hour	27	\$ 169	27	\$ 169	27	\$ 169	27	\$ 169	27	\$ 169	\$ 844	27	\$ 169	Assume 2/3 time spent in field.
Illegal Dumping Hotline	Receive public complaints regarding environmental concerns or hazards and nuisance conditions.	Y1-5	City Staff	\$ 60	Hour	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	\$ 12,000	40	\$ 2,400	1P 0.75H per week. Need current # complaints & dedicated hours.
	Investigate and abate nuisances and environmental problems.	Y1-5	City Staff	\$ 60	Hour	80	\$ 4,800	80	\$ 4,800	80	\$ 4,800	80	\$ 4,800	80	\$ 4,800	\$ 24,000	80	\$ 4,800	Assume 2x complaint time to investigate.
		Y1-5	Vehicle Time	\$ 6.26	Hour	54	\$ 338	54	\$ 338	54	\$ 338	54	\$ 338	54	\$ 338	\$ 1,689	54	\$ 338	Assume 2/3 time spent in field.
	Publicize Hotline.	Y1-5	Newspaper Ad	\$ 400	Ad	4	\$ 1,600	4	\$ 1,600	4	\$ 1,600	4	\$ 1,600	4	\$ 1,600	\$ 8,000	4	\$ 1,600	Adv. to include newspaper, site postings, and other methods.
NEW																			
Storm Sewer System Map	Assemble map of all major outfalls and receiving waters.	Y2	Contract	\$ 25,000	Each		\$ -	1	\$ 25,000		\$ -		\$ -		\$ -	\$ 25,000		\$ -	
Illicit Discharge Ordinance	1. Evaluate existing illicit discharge ordinance and prepare revised ordinance with enforcement provisions.	Y2	Contract	\$ 7,500	Each		\$ -	1	\$ 7,500		\$ -		\$ -		\$ -	\$ 7,500		\$ -	
		Y2-3	City Attorney	\$ 150	Hour		\$ -	6	\$ 900	4	\$ 600		\$ -		\$ -	\$ 1,500		\$ -	Work spans 2 years
	2. Adopt ordinance.	Y3	City Staff	\$ 60	Hour		\$ -	20	\$ 1,200	20	\$ 1,200		\$ -		\$ -	\$ 2,400		\$ -	1P 40H to coordinate contract activities, present to council, & inform appropriate personnel regarding ordinance. (work spans 2 years)
Detection and Elimination Program	1. Develop illicit discharge detection and elimination program designed to utilize dry weather inspections during low tides occurring during winter.	Y3	Contract	\$ 7,500	Hour		\$ -		\$ -	1	\$ 7,500		\$ -		\$ -	\$ 7,500		\$ -	
		Y3	City Attorney	\$ 150	Hour		\$ -		\$ -	4	\$ 600		\$ -		\$ -	\$ 600		\$ -	review enforceability of inspection protocol.
	2. Acquire equipment and conduct training.	Y3,5	City Staff	\$ 60	Hour		\$ -		\$ -	44	\$ 2,640		\$ -	16	\$ 960	\$ 3,600	8	\$ 480	1P 20H to acquire equip + organize training. 3P 8H for training. 3P 4H for refresh train every other year + 1P 4H to prep & follow refresher.
		Y3	Illicit Discharge	\$ 2,000	Unit		\$ -		\$ -	1	\$ 2,000		\$ -		\$ -	\$ 2,000		\$ -	1 detection set

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MCM-3 - ILLICIT DISCHARGE DETECTION AND ELIMINATION																			
BMP	Activity	Due Date	Cost Item	Unit Cost	Units	FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		Permit Cycle Cost	SIXTH YEAR		Remarks Assumptions
						Qnty.	Cost	Qnty.	Cost	Qnty.	Cost	Qnty.	Cost	Qnty.	Cost		Qnty.	Cost	
	3. Initiate program and tracking system.	Y4	City Staff	\$ 60	Hour		\$ -		\$ -		\$ -	40	\$ 2,400		\$ -	\$ 2,400		\$ -	1P 40H to review maps & identify outfalls + establish inspect & follow-up protocol.
	4. Implement program.	Y4+	City Staff	\$ 60	Hour		\$ -		\$ -		\$ -	210	\$ 12,600	210	\$ 12,600	\$ 25,200	180	\$ 10,800	1P 210H (~15%FTE) to inspect outfalls in Y4. 1P 210H investigate illicit discharges Y5. Hours should drop as illicit discharges eliminated.
		Y4+	Vehicle Time	\$ 6.26	Hour		\$ -		\$ -		\$ -	140	\$ 876	140	\$ 876	\$ 1,751	120	\$ 751	Assume 2/3 time spent in field.
Storm Sewer Inlet Stenciling	Using citizen volunteers stencil sewer inlets.	Y1-5	See MCM-1				\$ -		\$ -		\$ -		\$ -		\$ -	\$ -		\$ -	
General Commercial Business Brochure	Develop, produce, and distribute brochure for business regarding storm water quality and illicit discharges.	Y2-5	See MCM-1				\$ -		\$ -		\$ -		\$ -		\$ -	\$ -		\$ -	
TOTALS							\$ 19,407		\$ 54,007		\$ 33,947		\$ 35,283		\$ 33,843	\$ 176,487		\$ 31,438	
	Total hours for Staff		City Staff	1960		280		300		344		530		506			468		
	Total hours for Vehicle Time		Vehicle Time	1085		161		161		161		301		301			281		

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ADMINISTRATIVE COSTS																			
BMP	Activity	Due Date	Cost Item	Unit Cost	Units	FIRST YEAR		SECOND YEAR		THIRD YEAR		FOURTH YEAR		FIFTH YEAR		Permit Cycle Cost	SIXTH YEAR		Remarks Assumptions
						Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost	Qty.	Cost		Qty.	Cost	
Annual Report	Assemble and publish annual report.	NA	City Staff	\$ 60	Year	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	40	\$ 2,400	\$ 12,000	40	\$ 2,400	
Coordination	Coordinate various compliance activities.	NA	City Staff	\$ 60	Hour	100	\$ 6,000	100	\$ 6,000	100	\$ 6,000	100	\$ 6,000	100	\$ 6,000	\$ 30,000	100	\$ 6,000	Two hours per week.
TCEQ Inspection Time	Participate in TCEQ compliance inspection.	NA	City Staff	\$ 60	Hour		\$ -	8	\$ 480	8	\$ 480	8	\$ 480	8	\$ 480	\$ 1,920	8	\$ 480	
TOTALS							\$ 8,400		\$ 8,880		\$ 8,880		\$ 8,880		\$ 8,880	\$ 43,920		\$ 8,880	
	Total hours for Staff		City Staff	732		140		148		148		148		148			148		

CITY OF ANYTOWN STORM WATER MANAGEMENT PROGRAM COST ESTIMATE - PREPARED BY PBS&J

COST ITEMS/ASSUMPTIONS

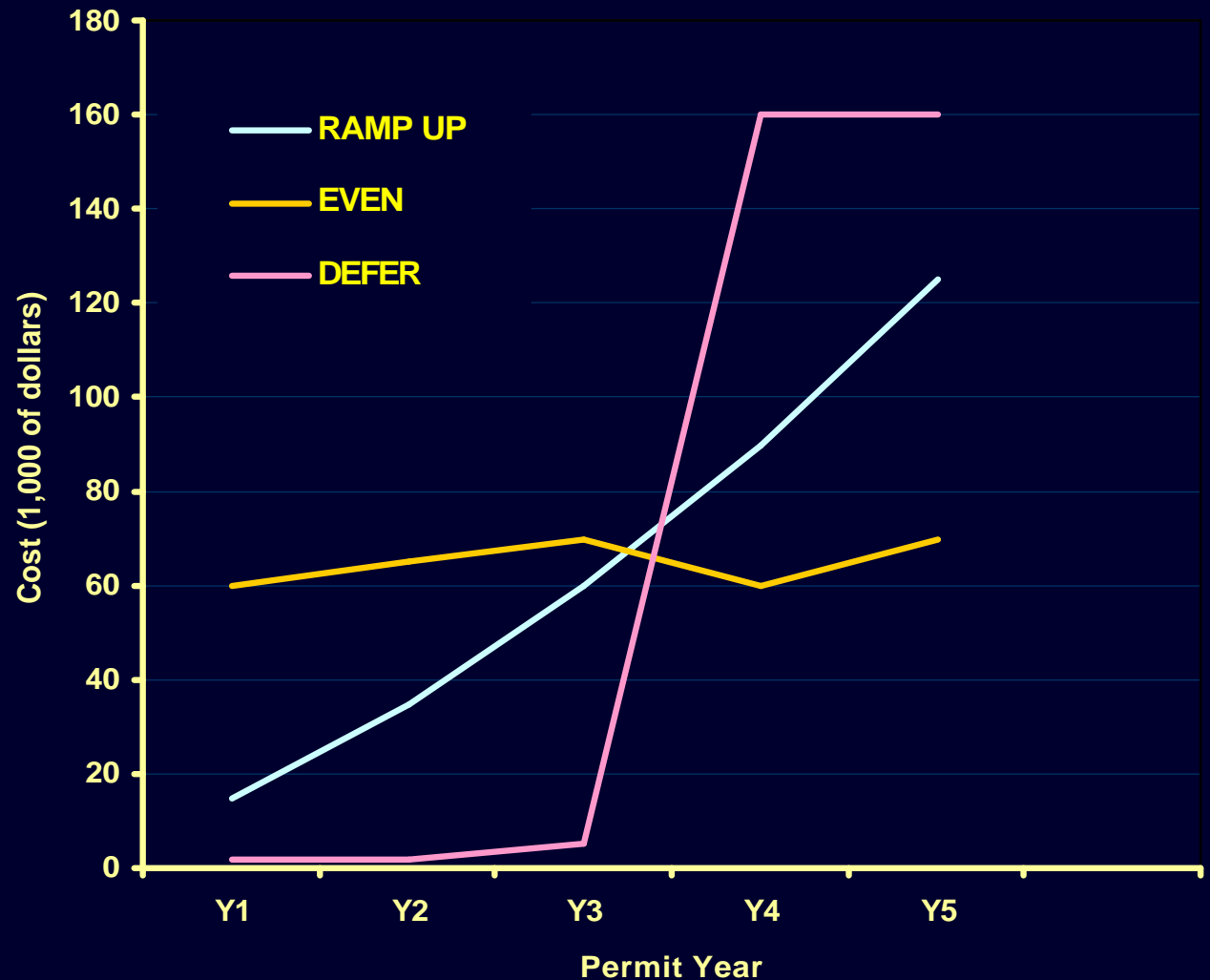
LABOR RATES	HOURLY	EQUIPMENT/ITEMS RATES	ITEM	SERVICES	ITEM			
City Attorney	\$ 150	Inlet Plaque	\$ 3	Graphic Design	\$ 100	Hour		
City Manager	\$ 80	Newspaper Ad	\$ 400	Contract	\$ 7,500	Varies		
City Director	\$ 70	Host Meeting	\$ 150	Printing	\$ 2			
City Staff	\$ 60	Illicit Discharge Equip.	\$ 2,000	Waste Disposal	\$ 6	yard		
		Street Sweeper	\$ 100,000					
		Custom Signs	\$ 300					
		Spill Kits	\$ 200					
		Wash Rack	\$ 20,000					
		Vehicle Time	\$ 6.26	hr				
FTE hour assumptions: 52 wks/yr @ 40hrs/wk is 2080 hrs. 10 days vacation, 12 days sick leave, & 12 holidays @ 8 hrs/day is 272 hrs. Two 15 minute breaks & 1 hr administrative work are expended per day for 339 hrs. Net hours available per employee is 1469 hrs.				VTE (Vehicle Time Equivalent) Hour assumptions: 52 wks/yr @ 40hrs/wk is 2080 hrs. 12 holidays + 5 maintenance days @ 8 hrs/day is 136 hrs. Two 15 minute breaks per day for 121.5 hours. Net hours available per truck is 1822.5 hrs.				
				Truck	\$ 30,000			
				Operational life	5	hrs		
				Truck cost per year	\$6,000			
				Miles per year	15,000	mi		
				Cost per mile	\$0.36			
				Annual Mileage Cost	\$5,400.00			
				Total cost per year	\$11,400.00			
				VTEs	1822.5	hrs		
				Vehicle cost per hour	\$ 6.26	hr		

EXPENDITURE PLANNING CONSIDERATIONS

Timing:
Adjust
schedule and
deadlines to
incur costs
when desired

Consider:

- Budget timing
- Revenue generation
- Utility formation



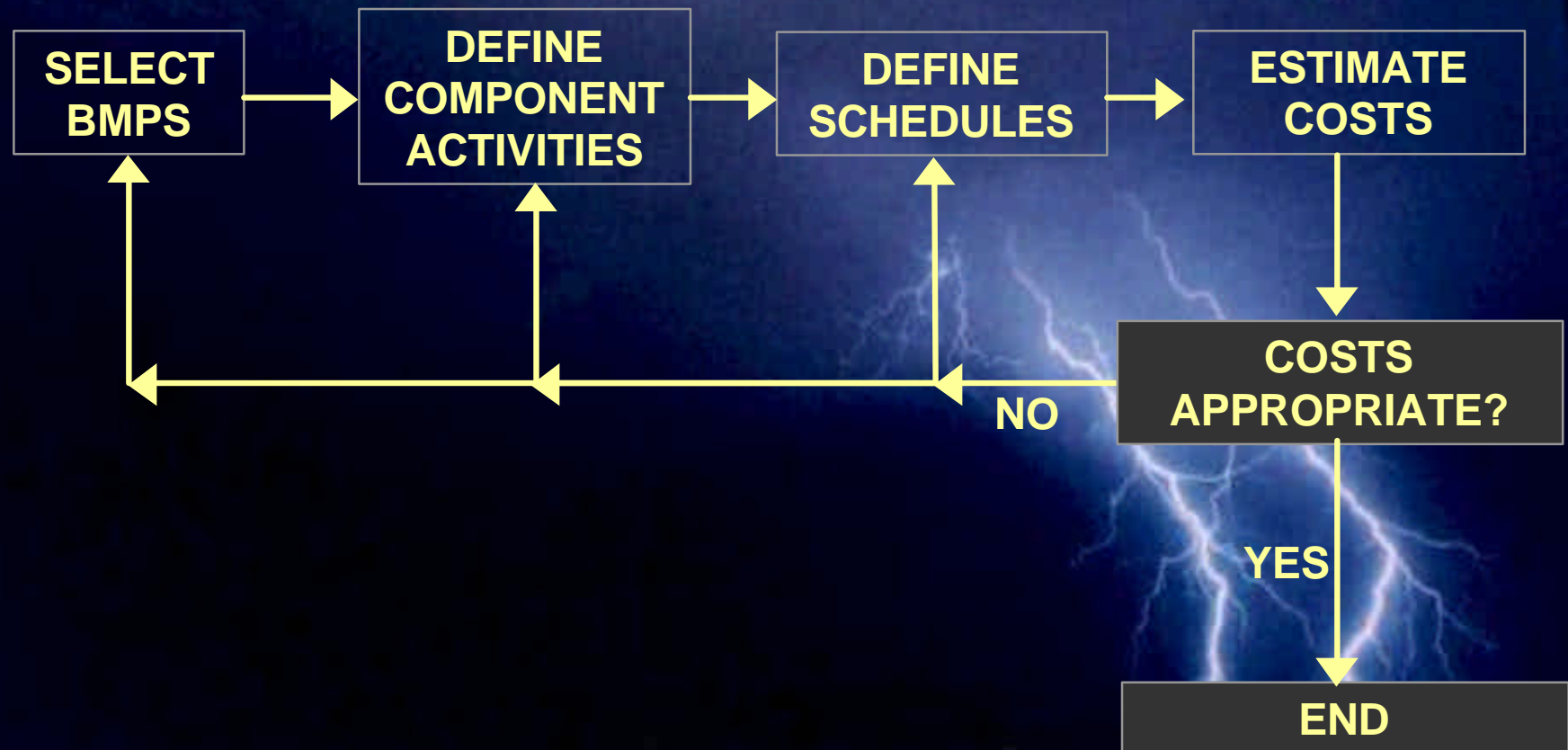
EXPENDITURE PLANNING CONSIDERATIONS

- BMP focused cost estimating may miss **administrative costs**:
 - Annual Reporting
 - Coordination and management of all activities
 - Inspection and audit time
- Include separate line items in cost estimate to address these “hidden” administrative costs



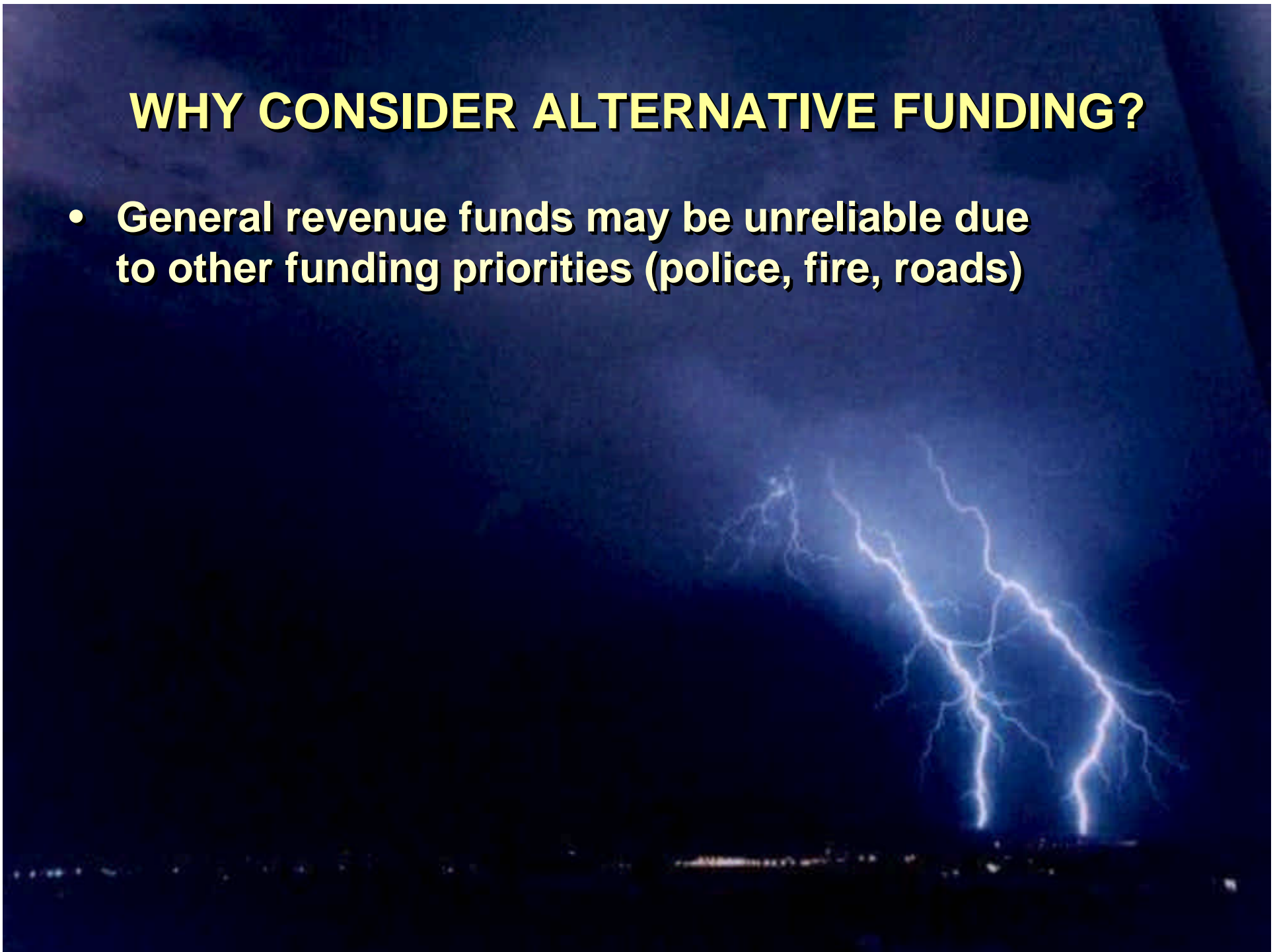
REVIEW AND REVISE

- Iterative process of review and revision



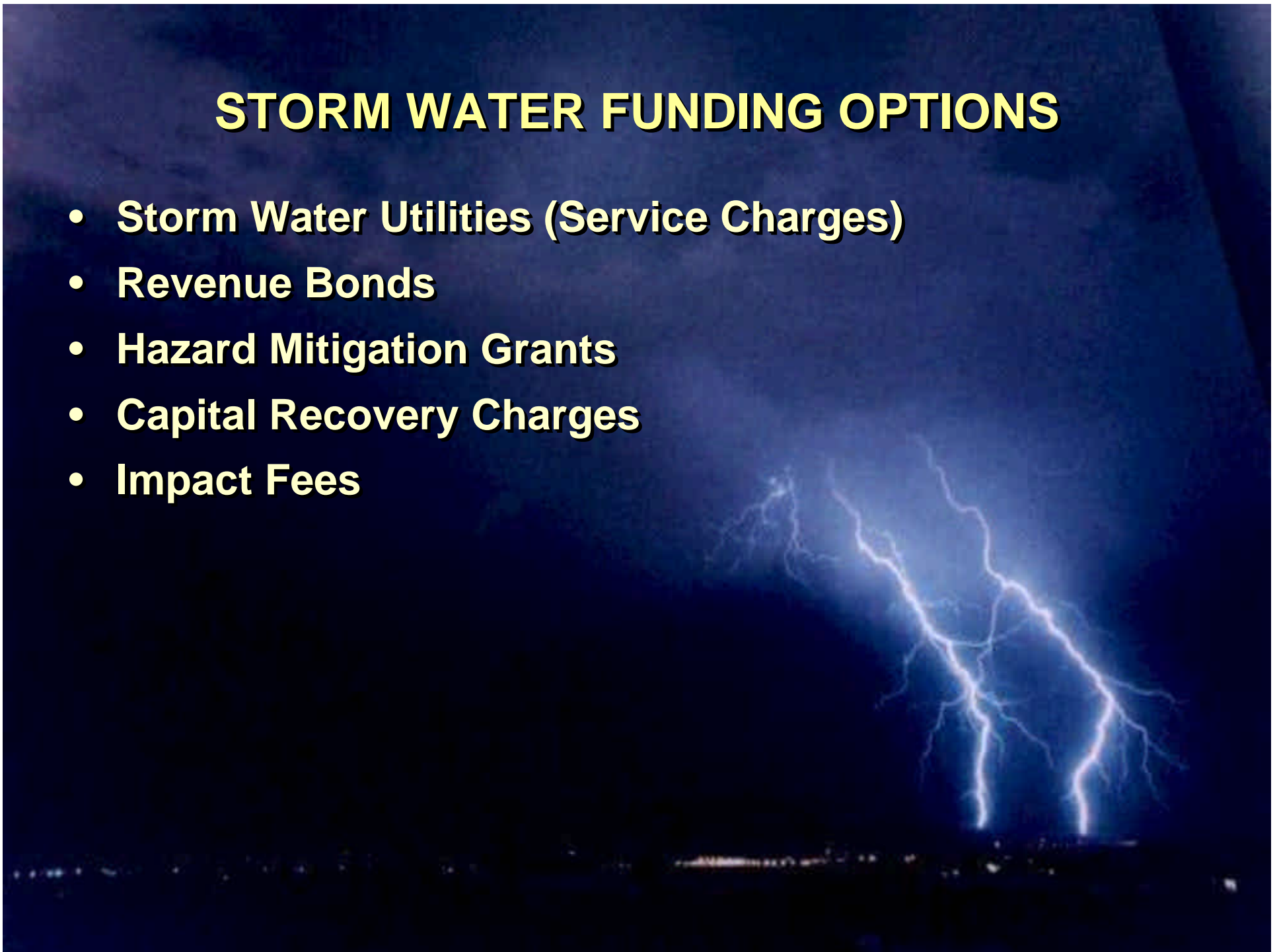
WHY CONSIDER ALTERNATIVE FUNDING?

- **General revenue funds may be unreliable due to other funding priorities (police, fire, roads)**



STORM WATER FUNDING OPTIONS

- **Storm Water Utilities (Service Charges)**
- **Revenue Bonds**
- **Hazard Mitigation Grants**
- **Capital Recovery Charges**
- **Impact Fees**



STORM WATER UTILITIES

- **Sub-unit of municipal government**
- **Manages storm water facilities providing drainage service to defined area**
- **Similar to a wastewater or water utility**
- **Funded by fee for service provided**
- **Dedicated, equitable, stable funding source**
- **Rate payers (“users”) only pay for their “demand” or burden on the system**
- **Rates typically based on lot impervious area**

REVENUE BONDS

- Bonds issued to fund infrastructure and capital projects
- Usually need utility and dedicated revenue stream to demonstrate payback ability
- Need master plan, CIP, and collection history to obtain bonds
- Usually 10 to 20 yr payback period



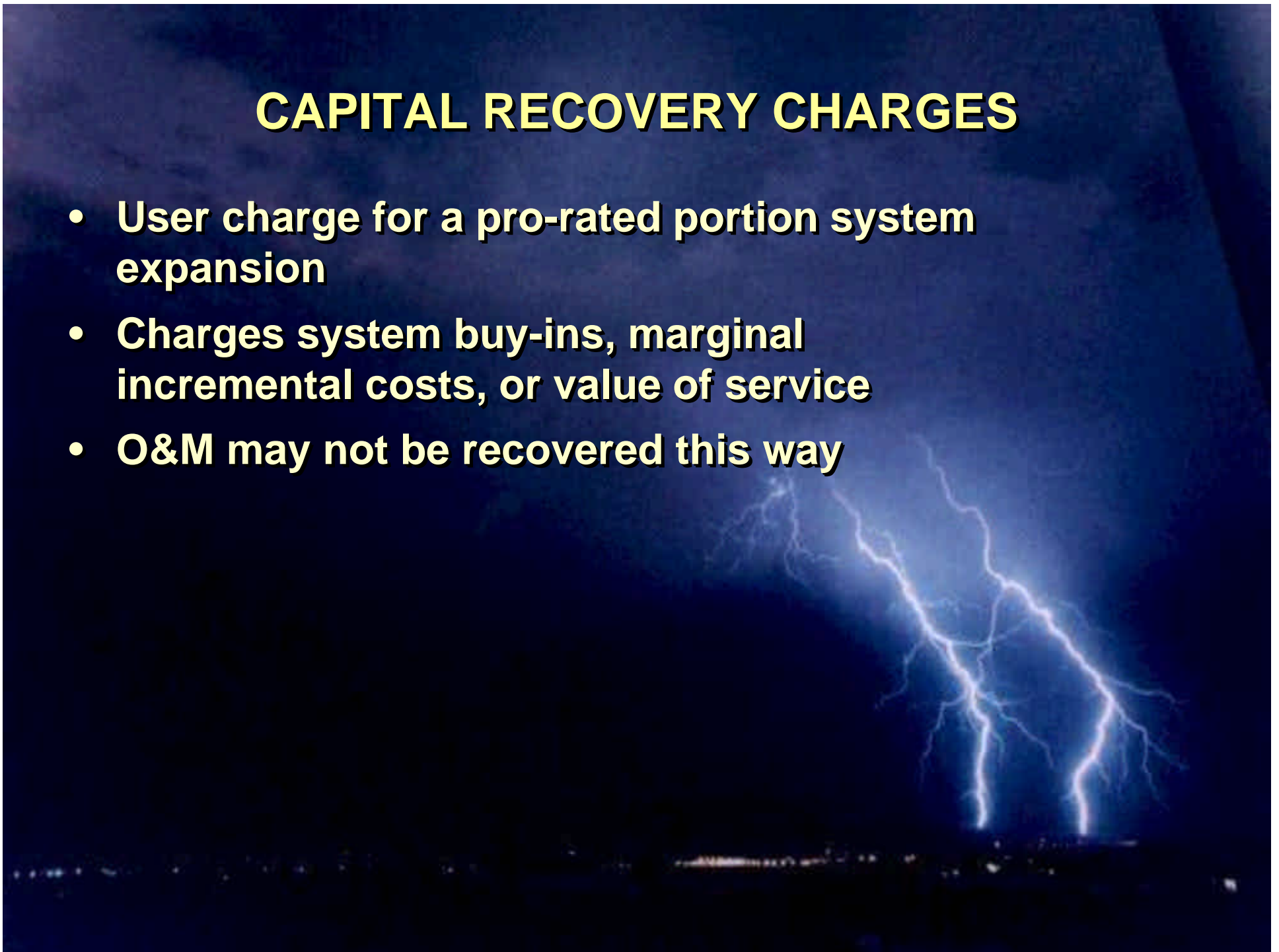
HAZARD MITIGATION GRANTS

- **Federal Emergency Management Agency (FEMA) provides grants to communities to reduce losses from disasters**
- **Flood loss mitigation funding is available with 25% local match**
- **Contingent on adopted-approved hazard mitigation plan**
- **Can fund buyouts, infrastructure improvements, etc.**



CAPITAL RECOVERY CHARGES

- **User charge for a pro-rated portion system expansion**
- **Charges system buy-ins, marginal incremental costs, or value of service**
- **O&M may not be recovered this way**



IMPACT FEES

- Fee charged to developer based on anticipated change in storm water runoff from the development
- Many approaches to setting fees
- Highly litigated issue
- Charge must be legally and technical defensible



REFERENCES

- Keller, B., 2001. *Buddy, Can You Spare a Dime? What's Stormwater Funding?* Stormwater, Vol. 2, No. 2.
http://www.forester.net/sw_0103_buddy.html
- Busco, D. and Lindsey, G., 2003. *An Internet Guide to Financing Stormwater Management*,
<http://stormwaterfinance.urbancenter.iupui.edu>
- Busco, D. and Lindsey, G., 2001. *Designing Storm Water User Fees: Issues and Options*. Stormwater, Vol. 2, No. 7.
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<http://www.nrdc.org/water/pollution/storm/chap4.asp>

MS4 PROGRAM COST ESTIMATING AND FUNDING OPTIONS

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